

Notice of Allowability

Application No.

10/811,337

Examiner

Charles Chow

Applicant(s)

BIRGENHEIER ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/2/2007.
2. ☒ The allowed claim(s) is/are 1-40.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Detailed Action

1. This office action is for amendment received on 7/2/2007.

Allowable Subject Matter

2. The following is an examiner's statement of reasons for allowance:

Claims 1-40 are allowable over the prior art of record. The prior arts fail to teach the allowable features, singly, particularly, or in combination or rendering obviousness.

Applicant has amended independent **claims 1, 26** with allowable features for, wherein each of said measured IF responses, is derived from measurements made at a plurality of frequencies within each of said overlapping frequency bands, together with,

the determining an estimated actual IF response & a set of conversion coefficients computed from the IF response such that the estimate reduces the effect of an uncertainty in knowledge of rf stimulus signal using IF response measurements.

Applicant has also amended the objected dependent claims 6, 11, 13, 14-15, 24, 26, 29 to be the independent claims with the objected allowable features as indicated in the last office action, and claims 30-40 were indicated to be allowable in the last office action mailed on 5/03/2007.

The dependent claims are also allowable due to their dependency upon the allowable independent claims above and the having additional claimed features.

The cited prior arts fail to teach the features in independent **claim 6**, for the removing an effect of rf tilt comprising

determining the estimate at a first setting of local oscillator of the receiver to obtain a non-image estimate $X(k)$;

adjusting the local oscillator to a second setting corresponding to an image IF response of the receiver relative to the first setting;

determining the estimate of the actual IF frequency response at the second setting to obtain an image estimate $X_{\text{image}}(k)$; and
combining the non-image estimate $X(k)$ and the image estimate $X_{\text{image}}(k)$ response to cancel the effect of the RF tilt.

The cited prior arts fail to teach the features in independent **claim 11**, for the wherein the IF responses are measured for overlapping frequency bands, the wherein the rf stimulus signal is a broadband signal comprising one or both of a summation of sine waves and a periodic chirped waveform, and wherein the broadband signal having
a period is reciprocal of Δf , step size or tuning resolution being either a difference between center frequencies of adjacent frequency bands of the plurality or a tuning resolution of a local oscillator.

The cited prior arts fail to teach the features in independent **claim 13**, for the wherein the conversion coefficient of the set defines a relationship between the actual IF frequency response and the IF frequency responses measured for overlapping frequency bands; and
wherein the relationship between the measured IF frequency response and the actual IF frequency response is given by $Y_i(k) = a_i * X(k) + N_i(k)$.

The cited prior arts fail to teach the features in independent **claims 14, 29**, for wherein the conversion coefficient of the set defines a relationship between the actual IF frequency response and the IF frequency responses measured for overlapping frequency bands; and
wherein the set of conversion coefficients is chosen to minimize a sum-square difference between the measured IF response for a plurality of overlapping frequency bands.

The cited prior arts fail to teach the features in independent **claim 15**, for the wherein the conversion coefficient of the set defines a relationship between the actual IF frequency response and the IF frequency responses measured for overlapping frequency bands; and

wherein the set of conversion coefficients is computed comprising
defining a set of half band IF response measurements in terms of the IF response measurements for overlapped frequency band portions, such that a half of the half-band measurements correspond to IF frequency response measurements in upper, lower, half-bands of the overlapped frequency band portions.

The cited prior arts fail to teach the features in independent **claim 24**, removing a delay misalignment from either the IF responses measured for the overlapping frequency bands of half-band IF response measurements corresponding to the measured IF response before the set of conversion coefficients are computed from the IF responses, together with, the determining an estimated actual IF response & a set of conversion coefficients computed from the IF response such that the estimate reduces the effect of an uncertainty in knowledge of rf stimulus signal using IF response measurements

The prior arts fail to teach the features in independent **claims 30, 33** for the characterizing an IF response having the system comprising a signal generator that applies rf stimulus; an IF processor that controls the signal generator, the receiver under test, and the IF processor, the controller processing the digitized IF response; and

a computer program stored in memory and executed by the controller, the computer program comprising instruction that when executed, implement determining an estimate of an actual IF response of the receiver under test from IF responses of the receiver under test measured at overlapping frequency bands and a set of conversion coefficients computed from the measured If response, such that the estimate reduces an effect of uncertainties in knowledge of the rf stimulus signal.

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The closest prior art **Golan [US 5,826,180]** teaches the calibrated image rejection having computed coefficients ϵ , α , for amplitude, phase correction [abstract, Fig. 3, col. 1, line 62 to col. 2, line 21; col. 3, lines 15-23 & method steps in col. 2, lines 29-58], but fails to teach the above allowable features, such as the determining an estimated of an actual IF response of the receiver under test at overlapping frequency bands associated with a set of computed conversion coefficients, from the measured IF response.

Miyauchi [US 2004/0041,554 A1] teaches removing of image signal by frequency sweeping of two band, $F_1 + F_2$ to $F_2 + F_2$, 4.3 to 6.3 GHz & $F_1 - F_2$ to $F_2 - F_2$, 3.7 to 5.7 GHz & obtaining measuring data $D1_j$, $D2_j$ [Fig. 11, abstract, paragraph 0065, 0076-0077, Fig. 7-10], but fails to teach the allowable features above which are also missed by Golan.

Dufour et al. [US 2003/0187,601 A1] teaches the overlapping frequency band calibration of a wideband direction finding system [Fig. 6, Fig. 4, paragraph 0095, 0098, 0088], to correct the gain & phase variations [abstract, paragraph 0102-0105], but fails to teach the above allowable features.

Other prior arts in below has been considered, but they fail to teach the above allowable features.

Fullerton et al. [US 2004/0136,438 A1]; **Nara [US 2005/0118,970 A1]**, Nov. 12, 2004, late on filing date, teaches overlapping frequency band F_b for the coefficients of the two frequency band calibrations, abstract]; **Finman [US 5,117,377]**, abstract Fig. 1a]; **Narita et al. [US 2004/0248,526 A1]**, teaches signal generator with filters]; **Kim [US 5,978,659]**, teaches calibration of telephone call conversation]; **Paulus [US 2005/0070,236 A1]**, teaches calibration tone 75 for removing image, paragraph 0042-0052, 0034-0035, 0063, 0146]; **Dalebroux et al. [US 6,636,722 B1]**; **Miyagi [US 6,920,321 B1]**, **Tarantino et al. [US 5,099,200]**; **Marino et al. [US 6,526,365 B1]**; **Cutler [US 6,842,608 B2]**, assignee]; **Cain et**

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al. [US 2003/0050,014 A1]; Huang et al [US 6,337,888 B1]; Ciccarelli et al. [US 6,785,529 B2, Fig. 9]; Heaton et al. [US 2005/0186,914 A1]; Green et al. [US 7,088,765 B1].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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July 24, 2007.


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